CLAIMS

1. (Currently amended) A system for diagnosing a gastrointestinal tract, comprising:

an ingestible device, arranged for traveling within a gastrointestinal tract of a body, comprising:

_____a probe, operative to perform, along said gastrointestinal tract, a diagnostic image by nuclear radiation of a radiopharmaceutical;

_____data-handling apparatus, in signal communication with said probe, for receiving and handling imaging data, generated by said probe;

_____a power source, for powering said probe and data-handling apparatus; and

_____a shell, which encapsulates said probe, data-handling apparatus, and power source within,

wherein said ~~probe~~ ingestible device comprises a plurality of nuclear-radiation detectors, arranged around said ~~shell~~probe, and

circuitry comprising at least one sensor adapted to determine the location of the ingestible device in the gastrointestinal tract and the circuitry is further adapted to reconstruct the diagnostic image based on said location.

2. (Currently amended) The system ~~ingestible device~~ of claim 1, wherein at least one of said nuclear-radiation detectors is arranged for detecting gamma and beta radiation.

3. (Currently amended) The ~~ingestible device~~system of claim 2, wherein said at least one nuclear-radiation detector is gated substantially to a photon energy associated with a particular radioisotope.

4. (Currently amended) The ~~ingestible device~~system of claim 2, wherein said at least one nuclear-radiation detector is gated substantially to at least two photon energies associated with two particular radioisotopes.

5. (Canceled).

6. (Currently amended) The ~~ingestible device~~system of claim 1, wherein some of said plurality of nuclear-radiation detectors may be gated substantially to a photon energy associated with a specific radioisotope, while others may be gated substantially to a ~~substantially to a~~ photon energy associated with a different radioisotope.

7. (Currently amended) The ~~ingestible device~~system of claim 2, wherein said at least one nuclear-radiation detector is not collimated, to detect nuclear radiation impinging at any angle.

8. (Currently amended) The ~~ingestible device~~system of claim 1, wherein said ingestible device is arranged as a compton camera.

9. (Withdrawn) A method of nuclear imaging, comprising:

scanning a radioactivity emitting source of at least two photon energies with at least one nuclear radiation detector, mounted on an ingestible device, and obtaining a count rate for the at least two photons;

monitoring the position of the ingestible device; and

calculating the depth of the radioactivity emitting source, at each position, based on the different attenuation of photons of different energies, emitted from the radioactivity emitting source.

10. (Withdrawn) The method of claim 9, and further including constructing an image of the radioactivity emitting source.

11. (Withdrawn) The method of claim 9, wherein the monitoring takes place at very short time intervals of between 100 and 200 miliseconds.

12. (Withdrawn) The method of claim 9, wherein said nuclear-radiation detector is not collimated, to detect nuclear radiation impinging at any angle.

13. (Withdrawn) The method of claim 9, and further including image reconstruction by deconvolution algorithms.

14. (Withdrawn) The method of claim 9, wherein said ingestible device comprises a nuclear-radiation detector, arranged for detecting gamma and beta radiation.

15. (Withdrawn) The method of claim 9, wherein said ingestible device comprises a plurality of nuclear-radiation detectors, arranged around the external surface of said ingestible device, for detecting gamma and beta radiation.